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ADDITIONS TO THE FLORA OF SONORA, MEXICO. II

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ABSTRACT

Twenty-three plant taxa are reported for Sonora, and four for Mexico, for the first time. Specimens, observations, and images are deposited in herbaria and are available in the SEINet and MABA online databases.

In 2010, Molina-Freaner and Van Devender published *Diversidad Biológica de Sonora*, which summarized the state of knowledge of all major plant and animal groups in Sonora, Mexico. In the chapter on vascular plants, Van Devender et al. (2010) included a list of the flora of the state of Sonora as an appendix. Since that time Van Devender and Reina-G. have maintained and updated the state flora list. The Southwest Environmental Information Network (SEINet 2014) is the primary source of herbarium collections from the southwestern USA and northwestern Mexico. Coverage in

Mexico is not as comprehensive because the first SEINet efforts were focused on Arizona collections. Data reported here help to fill this information gap.

The Madrean Archipelago Biodiversity Assessment (MABA) program at Sky Island Alliance was started in 2009. This program documents the distributions of all species of plants and animals in the Sky Island Region, especially in Sonora, Mexico. Information comes from historical sources (herbaria, museums, publications, field notes, etc.) and new field collections, observations, and images. Additional observations to document plants and animals have been made in nine isolated Sky Island mountain ranges and numerous other areas in Sonora.

Here we report 23 new plant taxa for the flora of Sonora. Four species are probably new for Mexico. Additional significances are added to individual accounts. Specimens identified by specialists are acknowledged; others were determined by the collectors. Some of them are from the MABA Expeditions to the Sierras Bacadéhuachi de los Ajos, la Huérfana [=Mazatán], la Púrica, and San Luis, and the Ciénega de Saracachi in Sonora. Others are from floristic inventories of Rancho el Aribabi (Delgado-Z.), Rancho San Bernardino (Delgado-Z.), the municipios of Hermosillo and Yécora (Reina-G., Van Devender), and the Sierra de Mazatán (Sánchez-E.).

All of these biological observations and related images are publicly available in the MABA database (www.madrean.org). The FLORA part of the database is directly linked to SEINet. Most of these range extensions are documented by herbarium specimens, but others are observations and/or photo vouchers in the MABA database or SEINet General Observations. Non-native species are denoted by "*".

SPECIES RECORDS

Ageratina rubricaulis (Kunth) King & H. Rob. (Asteraceae). **Mexico. Sonora.** Mpio. de Bacadéhuachi: Rincón de Guadalupe, 16.5 km (by air) ENE of Bacadéhuachi, Arroyo Campo los Padres (Río Riíto drainage) Sierra de Bacadéhuachi, 29°50'40" N 108°58'37" W, 1690 m, uncommon herbaceous perennial with white flowers in pine-oak forest, 31 Mar 2012, *Reina-G. 2012-275, Van Devender, Rice* (TEX, det. B.L. Turner, 2014).

Artemisia campestris L. (Asteraceae). **Mexico. Sonora.** Mpio. de Agua Prieta: Rancho Los Ojos, El Cajón Bonito, 6.3 km SE of MEX 2 (at 53 km E of Agua Prieta), Cuenca Los Ojos conservation area, 31°16'42" N 109°00'04" W, 1291 m, common herbaceous perennial in understory of cottonwood willow riparian forest, 26 Apr 2009, *Reina-G. 2009-77, Van Devender, Wilder, Kamp, Anderson* (ARIZ, MEXU, TEX); Ánimas Valley, 60.9 km (by air) E of Agua Prieta, Cuenca Los Ojos Foundation property, 31°18'19" N 108°53'14" W, 1610 m, locally very common annual in seasonally-flooded soils in *Nolina* plains grassland, 15 May 2010, *Van Devender 2010-392, Reina-G., Roll, Enderson,* (ARIZ, TEX, USON; all det. B.L. Turner).

Bidens oligantha Brandeg. (Asteraceae). **Mexico. Sonora.** Mpio. de Ímuris: Arroyo las Palomas, Rancho El Aribabi, a 29.3 km (línea recta) ENE de Ímuris, Sierra Azul, 30.81944° N -110.54833° W, 1345 m, 17 Sep 2011, *Delgado-Zamora 2011-261, Parra* (TEX, det. B.L. Turner).

Bidens schaffneri (A. Gray) Sherff **var. wrightii** (A. Gray) Melchert (Asteraceae). **Mexico. Sonora.** Mpio. de Ímuris: Cañón El Cajoncito cerca el Río Cocóspera, Rancho El Aribabi, 17.8 km (linea recta) ENE of Ímuris, 30.83944° N -110.68307° W, 933 m, 29 Oct 2011, *Delgado-Zamora 2011-354, Valdez-Coronel* (TEX, det B.L. Turner).

Significance. Bidens schaffneri var. *wrightii* is named for Charles Wright, botanist on the United States-Mexico boundary survey. He collected *Bidens schaffneri* in Sonora (MO) in 1851-52. After

the Gadsden Purchase in 1853, some of the Sonoran areas where Wright collected became Arizona. This collection verifies its presence in Sonora.

Helianthus quinquenervis Hook. (Asteraceae). **Mexico. Sonora.** Mpio. de Nacozari de García: Antennas on top of Sierra la Púrica, 19.1 km (by air) NNW of Nacozari, Reserva Forestal Nacional y Refugio de Fauna Silvestre Ajos-Bavispe, 30°32'39" N 108°54'55" W, 2467 m, locally abundant herbaceous perennial, rays and disks yellow, in pine forest, 17 Jul 2013, *Van Devender 2013-116, Reina-G., Ochoa-Gutiérrez* (TEX); antennas on top of Sierra la Púrica, 19.1 km (by air) NNW of Nacozari, Reserva Forestal Nacional y Refugio de Fauna Silvestre Ajos-Bavispe, 30°32'39" N 108°54'55" W, 2467 m, locally common robust herbaceous perennial, rays and disk yellow in pine forest, 9 Sep 2013, *Reina-G. 2013-330, Van Devender, Markgraf, Ávila, Roll, Minter, Deyo* (TEX, USON). All det. B.L. Turner.

Hieracium albiflorum Hook. (Asteraceae). **Mexico. Sonora.** Mpio. de Nacozari de García: Antennas on top of Sierra la Púrica, 19.1 km (by air) NNW of Nacozari, Reserva Forestal Nacional y Refugio de Fauna Silvestre Ajos-Bavispe, 30°32'39" N 108°54'55" W, 2467 m, uncommon herbaceous perennial in pine forest, 9 Sep 2013, *Reina-G. 2013-323, Van Devender, Markgraf, Ávila, Roll, Minter, Deyo* (TEX, USON, det. B.L. Turner).

Hymenopappus mexicanus A. Gray (Asteraceae). **Mexico. Sonora.** Mpio de Bacoachi: Sierra de los Ajos, slopes of Cerro de las Flores, 30.93518° N -109.95118° W, 2377 m, growing in open limestone glade, pine-oak-juniper Madrean woodland with *Pinus engelmannii, Quercus arizonica, Juniperus deppeana,* 25 Aug 2014, *Anderson 2014-34* (ASU).

***Sonchus arvensis** L. subsp. **uliginosus** (M. Bieb.) Nyman (Asteraceae). **Mexico. Sonora.** Mpio. de Hermosillo: Old Río Sonora channel, SW side of Hermosillo, gravel quarry, 29°03'43" N 111°01'20" W, 190 m, rare herbaceous perennial, flowers yellow in badly disturbed soil, 11 Feb 2014, *Reina-G. 2014-27, Van Devender* (TEX, det. B.L. Turner).

Significance. First record for Sonora and Mexico.

***Sonchus tenerrimus** L. (Asteraceae). **Mexico. Sonora.** Mpio. de Cucurpe: Ciénega de Saracachi, Rancho Agua Fría, Río Saracachi, 10.6 km (by air) ENE of Cucurpe, 30°21'35" N 110°35'53" W, 945 m, solitary annual, flowers yellow, 28 Apr 2011, *Reina-G. 2011-167, Van Devender, Phillips, Moser, Ochoa-Gutiérrez* (TEX, det. B.L. Turner).

Cerastium fastigiatum Greene (Asteraceae). **Mexico. Sonora.** Mpio. de Bacoachi: Puerto Frijolito, Sierra de los Ajos, 30.5 km (by air) ESE of Cananea, Ajos-Bavispe Reserva Forestal Nacional y Refugio de Fauna Silvestre, 30.95056° N -109.96333° W, 2289 m, 25 Aug 2014, *Carnahan 764, Hansen* (ARIZ).

Significance. First record for Sonora and probably Mexico.

Nama dichotomum (Ruiz & Pav.) Choisy (Boraginaceae). **Mexico. Sonora.** Mpio. de Cananea: Within 2 km of Ajos Nuevos station, Cañón de Evans, Sierra de los Ajos, 29.9 km (by air) E of Cananea, Ajos-Bavispe Reserva Forestal Nacional y Refugio de Fauna Silvestre, 30.97283° N -109.96075° W, 1905 m, rocky stream canyon, riparian deciduous forest in canyon, oak woodland and pine-oak forest on slopes, 27 Aug 2014, *Carnahan 805, Hansen* (ARIZ).

Draba helleriana Greene (Brassicaceae). **Mexico. Sonora.** Mpio. de Cananea: 10.9 km (by air) WNW of Cananea, along road to Observatorio Astrofisico Guillermo Haro, Sierra La Mariquita,

31°03'05" N -110°23'06" W, 2445 m, on rock face in pine-oak forest, 4 Aug 2013, *Van Devender 2013-152, Reina-G, Molina* (ARIZ, DES, MEXU, MO, TEX, USON, det. A. Salywon).

Chenopodium hians Standl. (Chenopodiaceae). **Mexico. Sonora.** Mpio. de Agua Prieta: Rancho los Ojos, Cajón Bonito, ca. 49.2 km (by air) ESE of Agua Prieta, 6.3 km SE of MEX 2 (at 53 km E of Agua Prieta), Cuenca Los Ojos Foundation conservation area, 31°16'42" N 109°00'04" W, 1291 m, rare herbaceous perennial in cottonwood-willow riparian forest, 30 Sep 2009, *Reina-G. 2009-1763, Van Devender, Schmidt, Turner* (ARIZ, SDSU, det. N. Benet-Pierce).

Significance. First records for Sonora and probably Mexico.

Chenopodium incanum (S. Wats.) A. Heller (Chenopodiaceae). **Mexico. Sonora.** Mpio. de Agua Prieta: Rancho El Valle, southern extension of the Ánimas Valley, 1.6 km S of MEX 2, Cuenca Los Ojos conservation area, ca. 61 km E of Agua Prieta on MEX 2, 31°18'33" N 108°56'08" W, 1616 m, common annual in disturbed soil in Plains grassland, 15 Aug 2007, *Van Devender 2007-747, Reina-G, Enderson* (ARIZ, SDSU, TEX, USON); E of Rancho La Bota, Ánimas Valley, 57.7 km (by air) E of Agua Prieta, Cuenca Los Ojos Foundation property, 31°18'44" N 108°53'52" W, 1609 m, locally common prostrate annual in disturbed soil in plains grassland, 17 May 2010, *Van Devender 2010-494, Reina-G., Roll* (ARIZ, SDSU, TEX, USON). All det. N. Benet-Pierce.

Chenopodium missouriense Aellen (Chenopodiaceae). **Mexico. Sonora.** Mpio. de Yécora: Restaurant La Palmita, 9.5 km W of Restaurant Puerto de la Cruz on MEX 16 (KM 258 E of Cd. Obregón), N side of Mesa del Campanero, 28°22'18"N 109°03'53"W, 1460 m, uncommon annual in oak woodland, 2 Oct 2003, *Reina-G. 2003-1158, Van Devender, Dimmitt, Eubanks* (SDSU); MpioYécora, 28°22'30" N 108°56' W, 1540 m, solitary 1.0 m tall annual on roadside near house, 17 Sep 1998, *Reina-G. 98-1200, Van Devender, Guerrero-R.* (SDSU, USON). All det. N. Benet-Pierce.

Iris missouriensis Nutt. (Iridaceae). **Mexico. Sonora.** Mpio. de Bacoachi: Arroyo Hoya del Packard, 1.0 km (along old logging road) SW from head of canyon, (0.85 km airline SSE Cerro Pelon), Sierra Los Ajos, Reserva Forestal Nacional y Refugio de Fauna Silvestre Ajos-Bavispe, 30.9366° N -109.9644° W, 2250 m, deep soil in limestone near moist streamside, 24 Aug 2014, *Ferguson 3615* (ARIZ); base of Cerro las Flores, 32.9 km (by air) ESE of Cananea, Sierra de los Ajos, 30.9357° N -109.9576° W, 2373 m, 5 Aug 1998, *Schwalbe, Alberti* (MABA observation); Hoya de Packard, S of Cerro Pelón, Sierra de los Ajos, 29.9 km (by air) ESE of Cananea, Ajos-Bavispe Reserva Forestal Nacional y Refugio de Fauna Silvestre, 30.9256248° N -109.98684° W, 2082 m, rocky mountainside in pine-oak forest, 24 Aug 2014, *Anderson* (MABA observation); Puerto Frijolito, Sierra de los Ajos, 30.5 km (by air) ESE of Cananea, Ajos-Bavispe Reserva Forestal Nacional y Refugio de Fauna Silvestre, 30.94567° N -109.96175° W, 2336 m, rocky mountainside in pine-oak forest, 25 Aug 2014, *S. Carnahan, K. Hansen* (MABA observation).

Significance. An observation of this species was reported for the Sierra de los Ajos by Fishbein et al (1995). *Ferguson 3615* is the first herbarium specimen for Sonora.

Juncus saximontanus A. Nels. (Juncaceae). **Mexico. Sonora.** Mpio. de Cucurpe: Cañón El Quemado, Arroyo La Palmita, 16.2 km (by air) ENE of Cucurpe, 30°21'51"N 110°32'30"W, 984 m, locally abundant, perennial in cotton-willow riparian forest, mesquite bosque and desert grassland above stream, 29 Apr 2011, *Van Devender 2011-222, Reina-G., Phillips, Moser, Ochoa-Gutiérrez* (ASC, EIU, USON, det. M. Licher & G. Rink).

Monarda fistulosa L. subsp ***menthifolia*** Graham (Lamiaceae). **Mexico. Sonora.** Mpio. de Bacoachi: Sierra de los Ajos, slopes of Cerro de las Flores, 30.93518°N -109.95118°W, 2377 m, pine-

oak-juniper Madrean woodland with *Pinus engelmannii, Quercus arizonica, Juniperus deppeana*, 25 Aug 2014, *Anderson 2014-40* (ASU).

Mirabilis melanotricha (Standl.) Spellenberg (Nyctaginaceae). **Mexico. Sonora.** Mpio. de Bacoachi: Puerto Frijolito, N of Cerro las Flores, Sierra de los Ajos, Ajos-Bavispe Reserva Forestal Nacional y Refugio de Fauna Silvestre, 30.94567°N -109.96175°W NAD27 , 2316 m, flowers deep pink, sepals washed with purple in pine-oak forest, 25 Aug 2014, *Carnahan 777, Van Devender, Reina-G., Ferguson, Hansen* (ARIZ).

Scoparia montevidensis (Spreng.) R.E. Fries (Plantaginaceae). **Mexico. Sonora.** Mpio. de Ures: Sierra de Mazatán. A 3.75 km (en línea recta) al SE del poblado de Rancho Viejo, sobre el camino que conduce a la cima de la sierra, 29.1119444 -110.278611, 495 m, herbácea anual, flores amarillas, rara creciendo sobre el arroyo en sustrato muy húmedo in matorral espinoso de pie de monte, 16 Mar 2004, *Sánchez-Escalante* 04-063, *Espericueta-Betancourt* (USON, det. J. Boggan).

Significance. First records for Sonora and Mexico.

Bromus mucroglumis Wagon (Poaceae). **Mexico. Sonora.** Mpio. de Cananea: Ajos Nuevos station, Cañón de Evans, Sierra de los Ajos, 29.9 km (by air) E of Cananea, Ajos-Bavispe Reserva Forestal Nacional y Refugio de Fauna Silvestre, 30°58.37' N -109°57.645° W, 1905 m, 24 Aug 2014, *Reina-G. 2014-402, Van Devender, Jimenez-M.* (ARIZ, det. M. Bauer).

Agrimonia striata Michx. (Rosaceae). **Mexico. Sonora.** Mpio. de Cananea: Ajos Nuevos Station, Ajos-Bavispe Reserve, Sierra de los Ajos, near Cananea, 30.97283° N -109.96075° W NAD27, 1905 m, riparian deciduous forest, 28 August 2014, *Carnahan 810, Hansen, Van Devender, Reina-G., Ferguson,* (ARIZ); Ajos Nuevos station, Cañón de Evans, Sierra de los Ajos, 29.9 km (by air) E of Cananea, Ajos-Bavispe Reserva Forestal Nacional y Refugio de Fauna Silvestre, 30.97283° N -109.96075° W, 1905 m, rocky stream canyon, riparian deciduous forest in canyon, oak woodland and pine-oak forest on slopes, 24 Aug 2014, *Reina-G. 2014-383, Van Devender, R.E. Jiménez-M.* (ARIZ, ASC, MEXU, USON).

Stenotis greenei (A. Gray) Terrell & H. Rob. (Rubiaceae). **Mexico. Sonora.** Mpio. de Cananea: Within 2 km of Ajos Nuevos station, Cañón de Evans, Sierra de los Ajos, 29.9 km (by air) E of Cananea, Ajos-Bavispe Reserva Forestal Nacional y Refugio de Fauna Silvestre, 30.97283° N -109.96075° W, 1905 m, rocky stream canyon at riparian deciduous forest in canyon, oak woodland and pine-oak forest on slopes, 27 Aug 2014, *Carnahan 804, Hansen* (ARIZ).

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